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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

032326-157

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)

Unassigned

09/890951

INTERNATIONAL APPLICATION NO.
PCT/FROO/00230

INTERNATIONAL FILING DATE
31 January 2000

PRIORITY DATE CLAIMED
9 February 1999

TITLE OF INVENTION

METHOD FOR DETECTING PORTABLE OBJECTS AND SYSTEM FOR CARRYING OUT SAID METHOD

APPLICANT(S) FOR DO/EO/US

Omar MESSLEM, Philippe PORTE and Denis PRACA

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and the PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
- ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
- ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
- ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
- ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
- ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☐ Other items or information:

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7. ☒ The following fees are submitted:

Basic National Fee (37 CFR 1.492(a)(1)-(5)):

Neither international preliminary examination fee (37 CFR 1.482)
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO
and International Search Report not prepared by the EPO or JPO \$1,000.00 (960)

International preliminary examination fee (37 CFR 1.482) not paid to
USPTO but International Search Report prepared by the EPO or JPO \$860.00 (970)

International preliminary examination fee (37 CFR 1.482) not paid to USPTO
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 (958)

International preliminary examination fee paid to USPTO (37 CFR 1.482)
but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 (956)

International preliminary examination fee paid to USPTO (37 CFR 1.482)
and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 (962)

ENTER APPROPRIATE BASIC FEE AMOUNT =

CALCULATIONS

PTO USE ONLY

\$ 860.00

\$ -0-

Surcharge of \$130.00 (154) for furnishing the oath or declaration later than
months from the earliest claimed priority date (37 CFR 1.492(e)).

20 ☐ 30 ☐

Claims	Number Filed	Number Extra	Rate
Total Claims	15 -20 =	-0-	X\$18.00 (966)
Independent Claims	2 -3 =	-0-	X\$80.00 (964)
Multiple dependent claim(s) (if applicable)			+ \$270.00 (968)

TOTAL OF ABOVE CALCULATIONS =

\$ 860.00

Reduction for 1/2 for filing by small entity, if applicable (see below).

\$ -0-

SUBTOTAL =

\$ 860.00

Processing fee of \$130.00 (156) for furnishing the English translation later than
months from the earliest claimed priority date (37 CFR 1.492(f)).

20 ☐ 30 ☐

\$ -0-

+

TOTAL NATIONAL FEE =

\$ -0-

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by
an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 (581) per property +

\$ 40.00

TOTAL FEES ENCLOSED =

\$ 900.00

**Amount to be:
refunded**

\$

charged

\$

a. ☐ Small entity status is hereby claimed.

b. ☒ A check in the amount of \$ 900.00 to cover the above fees is enclosed.

c. ☐ Please charge my Deposit Account No. 02-4800 in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

d. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-4800. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

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28,632

REGISTRATION NUMBER

Patent
Attorney's Docket No. 032326-157

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)
Omar MESSLEM et al) Group Art Unit: Unassigned
Application No.: Unassigned) Examiner: Unassigned
Filed: August 8, 2001)
For: METHOD FOR DETECTING)
PORTABLE OBJECTS AND)
SYSTEM FOR CARRYING OUT)
SAID METHOD)

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination and the calculation of filing fees, kindly amend the above-identified application as follows:

IN THE SPECIFICATION:

Page 1, immediately following the title appearing on lines 1 and 2, insert the following:

--This disclosure is based upon, and claims priority from French Application No. 99/01521, filed on February 9, 1999 and International Application No. PCT/FR00/00230, filed January 31, 2000, which was published on August 17, 2000 in a language other than English, the contents of which are incorporated herein by reference.

Background of the Invention--

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Page 3, replace the paragraph beginning at line 3 as follows:

--Thus, if a network of 64 antenna, for example, is considered, the minimum time for detecting a portable object in front of an antenna being 25 milliseconds, each antenna is interrogated every 1.6 seconds (64 x 25 milliseconds).--

Page 3, between lines 26 and 27, insert the following heading:

--**Summary of the Invention**--

Page 6, before line 25, insert the following heading:

--**Brief Description of the Drawings**--.

Page 7, before line 9, insert the following heading:

--**Detailed Description**--.

Add the following Abstract:

--A method for detecting portable objects from a network of N antennae controlled by a centralized management unit. Signals are simultaneously emitted by the management unit to all antennae. Resulting response signals from antennae that have detected a portable object are received by the management unit. Each object thus detected is successively selected from these signals according to a pre-established sequence. The invention applies in particular to access control.--

IN THE CLAIMS:

Kindly replace claims 1-13, as follows.

1. (Amended) A method of detecting portable objects using a network of N antennae, controlled by a centralised management unit, comprising the following steps:
transmitting signals simultaneously to all the antennae from said management unit,
receiving a resulting signal by said management unit, said resulting signal comprising response signals from the antennae which have detected a portable object, and
successively selecting each object detected from this resultant signal, according to a pre-established sequence.

2. (Amended) A detection method according to Claim 1, wherein the successive selection of each object is effected by the use of an anti-collision algorithm.

3. (Amended) A detection method according to Claim 1, wherein the reception of the resulting signal by the management unit is obtained by the reception of the response signals from the antennae respectively at an input port of the unit assigned to each antenna, and adding said signals.

4. (Amended) A detection method according to Claim 1, wherein the reception of a resulting signal by the management unit is obtained by reception of said resulting signal at an input port of the unit that is assigned to all the antennae in the system.

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5. (Amended) A detection method according to claim 1, wherein the reception of the resulting signal includes a step of identifying the origin of the response signals forming said resulting signal.

6. (Amended) A detection method according to claim 14, wherein the identification of a response signal includes a step of storing the identification of the antenna associated with the input port at which the response signal is received.

7. (Amended) A detection method according to Claim 6, wherein said storing step includes positioning a flip-flop in a logic state and deactivating it when the unit has entered into communication with the portable object detected by the corresponding antenna.

8. (Amended) A detection method according to claim 15, wherein the identification of a response signal includes a step of concatenating the identification of the antenna in the response signal sent by the antenna.

9. (Amended) A system of detecting portable objects including a network of N antennae associated with transmission/reception means and a centralised management unit, comprising:

transmission means in the management unit that is connected to transmission/reception means of the antennae and that sends signals simultaneously to all the antennae,

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means for successively selecting each portable object detected according to a pre-established sequence.

11. (Amended) A detection system according to Claim 9 wherein the transmission and reception means of the management unit and the transmission/reception means of the antenna are connected in point-to-point mode by connections of the serial transmission type.

12. (Amended) A detection system according to Claim 9 wherein the transmission and reception means of the management unit include an input port connected to all the antennae by a connection of the serial transmission type.

13. (Amended) A detection system according to Claim 11, wherein the management unit includes an antenna discriminator.

Add the following new claims:

--14. (New) A detection method according to claim 3, wherein the reception of the resulting signal includes a step of identifying the origin of the response signals forming said resulting signal.

15. (New) A detection method according to claim 4, wherein the reception of the resulting signal includes a step of identifying the origin of the response signals forming said resulting signal.--


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REMARKS

Entry of the foregoing amendment is respectfully requested. This amendment is intended to place the claims in a more conventional format and eliminate the multiple dependency of the claims.

Respectfully submitted,

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Date: August 8, 2001

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Attachment to Preliminary Amendment dated August 8, 2001

Marked-up Copy

Page 3, Paragraph Beginning at Line 3

Thus, if a network of [60] 64 antenna, for example, is considered, the minimum time for detecting a portable object in front of an antenna being 25 milliseconds, each antenna is interrogated every 1.6 seconds (64 x 25 milliseconds).

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Marked-up Claims 1-13

[- the transmission by the management unit of] transmitting signals simultaneously
to all the antennae from said management unit,

[- the reception by the said unit of] receiving a resulting signal by said management
unit, said resulting signal comprising response signals from the antennae which have
detected a portable object, and

[- the successive selection of] successively selecting each object detected from this resultant signal, according to a pre-established sequence.

2. (Amended) A detection method according to Claim 1, [characterised in that] wherein the successive selection of each object is effected by the use of an anti-collision algorithm.

3. (Amended) A detection method according to Claim 1, [characterised in that]
wherein the reception of the resulting signal by the management unit is obtained by the
reception of the response signals from the antennae respectively at [the] an input [point]
port of the unit [reserved for] assigned to each antenna, and adding [the] said signals.

Attachment to Preliminary Amendment dated August 8, 2001

Marked-up Claims 1-13

4. (Amended) A detection method according to Claim 1, [characterised in that] wherein the reception of a resulting signal by the management unit is obtained by reception of [the] said resulting signal at an input [point] port of the unit [reserved for] that is assigned to all the antennae in the system.

5. (Amended) A detection method according to [any one of the preceding claims, characterised in that] claim 1, wherein the reception of the resulting signal includes a step of identifying the origin of the response signals forming [the] said resulting signal.

6. (Amended) A detection method according to [Claims 3 and 5, characterised in that] claim 14, wherein the identification of a response signal includes a step of storing the identification of the [corresponding] antenna [known by] associated with the input [point] port at which the response signal is received.

7. (Amended) A detection method according to Claim 6, [characterised in that the storage consists of] wherein said storing step includes positioning a flip-flop in a logic state and deactivating it when the unit has entered into communication with the portable object detected by the corresponding antenna.

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Attachment to Preliminary Amendment dated August 8, 2001

Marked-up Claims 1-13

8. (Amended) A detection method according to [Claims 4 and 5, characterised in that] claim 15, wherein the identification of a response signal includes a step of concatenating the identification of the antenna in the response signal sent by the antenna.

9. (Amended) A system of detecting portable objects including a network of N antennae associated with transmission/reception means and a centralised management unit, [characterised in that] comprising:

[- the management unit (OG) includes:

- transmission/reception means (ER1) connected to the transmission/reception means of the antennae,

- the] transmission means [of] in the management unit [being able to send] that is connected to transmission/reception means of the antennae and that sends signals simultaneously to all the [antenna] antennae,

[- and the] reception means [of the] in said unit being [able to receive the] that is connected to said transmission/reception means and that receives response signals from the antennae which have detected a portable object, in the form of distinct signals for each antenna or a resulting signal[, according to] in accordance with the type of connection established between the transmission[/] and reception means of the management unit and the antennae, and

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Marked-up Claims 1-13

[-] means [(AL)] for successively selecting each portable object detected according to a pre-established sequence.

10. (Amended) A detection system according to Claim 9, [characterised in that] wherein the means for successively selecting each portable object detected in a pre-established sequence includes an anti-collision algorithm.

11. (Amended) A detection system according to Claim 9 [or 10, characterised in that] wherein the transmission[/] and reception means of the management unit and the transmission/reception means of the antenna are connected in point-to-point mode [(I1-IN)] by connections of the serial transmission type.

12. (Amended) A detection system according to Claim 9 [or 10, characterised in that] wherein the transmission[/] and reception means of the management unit include an input [point (I)] port connected to all the antennae by a connection of the serial transmission type.

13. (Amended) A detection system according to Claim 11, [characterised in that] wherein the management unit includes an antenna discriminator [(D)].

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METHOD OF DETECTING PORTABLE OBJECTS AND SYSTEM FOR
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The invention relates to a method of detecting portable objects using a network of N antennae and a detection system implementing the said method.

Hereinafter antenna means the antenna itself but also the electronics, associated with the said antenna, for transmitting and receiving signals.

Portable object means any information carrier of the smart card type provided with an antenna, or any electronic label.

Generally antennae are put in a network when the management unit responsible for taking a decision has to be centralised. This is for example the case when it is sought to effect a physical access control for a dwelling, or access control in the case of a public

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building. It is also the case when it is wished to keep a trace on an object in a database.

Putting antennae in a network makes it possible not to duplicate the intelligence of the system and reduces the costs of the installation. Use will therefore be made, for this purpose, of a management system including a unit for the centralised management of the network.

Such an organisation is not without difficulties. This is because the centralisation of the intelligence of the system gives rise to problems related in particular to the operating mode of the management unit.

At the present time, putting N antennae in a network is managed by a scrutiny algorithm which successively selects the antennae in order to check the presence of a portable object. The major drawback of this solution is that an antenna is selected even if no portable object is presented to it. This therefore gives rise to a loss of time proportional to the number of antennae in the network, and prevents the management unit from devoting itself to other tasks.

Where several portable objects are detected by the same antenna, the management unit manages this situation by means of an anti-collision algorithm in order to select the portable objects which have been detected by this antenna, one after the other.

When the unit has finished communicating with the portable objects by means of this antenna and when it

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has adjusted the phenomena of collision on this antenna, it passes to another antenna.

Thus, if a network of 60 antenna, for example, is considered, the minimum time for detecting a portable object in front of an antenna being 25 milliseconds, each antenna is interrogated every 1.6 seconds (64 x 25 milliseconds).

Where such a system is used in access control, a user must wait up to 1.6 seconds before obtaining a response from the detection system.

The centralisation of the management unit therefore gives rise to problems, notably the problems set out below:

- an increase in the complexity of the system due to the management of the scrutiny,
- the reaction time extended by the scrutiny of the antennae,
- the complex installation, since the management unit must know the configuration of the network,
- the antennae are interrogated even if no object is presented,
- the number of antennae in the system is limited by the scrutiny time.

The purpose of the present invention is to remedy these problems.

The first object of the invention is a method of detecting portable objects making it possible to manage a large number of antennae in a manner which is transparent for the management unit.

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According to another variant, the reception of a resulting signal by the management unit is obtained by the reception of the said resulting signal at an input

point of the unit reserved for all the antennae in the network.

According to a variant, the reception of the resulting signal includes a step of identifying the origin of the response signals forming the said resulting signal.

The identification of a response signal includes a step of storing the identification of the corresponding antenna known by the input point at which the response signal is received.

In a variant, the storage consists of positioning a flip-flop in a logic state and deactivating it when the unit has come into communication with the portable object detected by the corresponding antenna.

In another variant, the identification of a response signal includes a step of concatenating the identification of the antenna in the response signal sent by the antenna.

Another object of the present invention consists of a system of detecting portable objects including a network of N antennae associated with transmission/reception means and a centralised management unit, principally characterised in that:

- . the management unit includes:
 - transmission/reception means connected to the transmission/reception means of the antennae,
 - the transmission means of the management unit being able to send signals simultaneously to all the antenna,

- and the reception means of the said unit being able to receive the response signals from the antennae which have detected a portable object, in the form of distinct signals for each antenna or a resulting signal, according to the type of connection established between the transmission/reception means of the management unit and the antennae, and

- means for successively selecting each portable object detected according to a pre-established sequence.

The means for successively selecting each portable object detected according to a pre-established sequence include an anti-collision algorithm.

According to one embodiment, the transmission/reception means of the management unit and the transmission/reception means of the antennae are connected in point to point mode by connections of the serial transmission type.

According to another embodiment, the transmission/reception means of the management unit include an input point connected to all the antennae by a connection of the serial transmission type.

In the case of the first embodiment, the management unit includes an antenna discriminator.

Other particularities and advantages of the invention will emerge clearly from a reading of the description given below with regard to the drawings, in which:

- Figure 1 depicts the outline diagram of the invention,

- Figure 2 depicts an outline diagram according to a variant of the invention,

- Figure 3 depicts a first embodiment of the invention,

5 - Figure 4 depicts a second embodiment of the invention, and

- Figure 5 depicts a third embodiment of the invention.

10 According to the method of the invention, the management unit OG is able to send simultaneously to all the antennae signals which it transmits and to receive all the responses from the said antennae in the form of a resulting signal S.

15 Thus all the antennae are seen by this management unit OG as a single entity as depicted in Figure 1.

20 The management unit OG is also able to successively select the portable objects detected by the said antennae in order to communicate with them (a function bearing the reference COM), this selection taking place in a pre-established sequence.

In practice, the successive selection will be effected by an anti-collision algorithm AL whatever it is.

25 The anti-collision algorithm AL makes it possible to detect a portable object amongst Q presented to N antennae.

30 There are many anti-collision algorithms for making a selection according to a pre-established sequence. This sequence may manage for example a degree of priority, that is to say it would make it

5 The algorithm can also allow communication between the management member and a portable object according to a serial number given in an arbitrary fashion to the antennae and defined by the configuration of the system.

In this variant provision is made for each antenna from A1 to AN to be able to detect one or more objects. This variant in no way changes the principle of the invention. Provision is also made for the connection between the antennae and the management unit to be of the point to point type, as will be seen in more detail with regard to Figure 3.

The advantage of the invention is that the concept of scrutiny of the state of the art disappears completely.

Because of this, the time required for establishing communication with a portable object presented in front of any antenna no longer depends on the number of antennae present on the network, but
5 solely on the number of portable objects presented simultaneously and the performance of the anti-collision algorithm.

Another consequent advantage of this invention concerns the possibility of managing priorities. The
10 concept of priority is valid both for the selection of an antenna and for the selection of a portable object.

Finally, this solution does not require multiplication of the number of management units in order to guarantee the performance of a detection
15 system in a network of antennae.

A description will now be given of three embodiments corresponding to implementation systems with different configurations and able to respond to applications which may be different.

20 The first embodiment is shown in Figure 3.

In this embodiment, there is a system connected with the network of antennae in point to point mode. The connection can be an RS485 or RS422 or RS232 or other link.

25 The management system TG includes the management unit OG strictly speaking provided with the intelligence for processing and analysing the information received from the portable objects. The management unit simultaneously interrogates all the
30 antennae of the array in order to detect the presence

of a portable object. This is represented by all the signals E transmitted at the outputs O1-ON by the transmission/reception device ER1 of the management system TG.

5 The responses received from the network of antennae are represented by the signals R coming from the transmission/reception circuits ER2 of the network of antennae and arriving at the inputs I1-IN.

10 Naturally each antenna has its own transmission/reception circuit, but this is shown here schematically in the form of a block, this block illustrating the complete equipment of the network of antennae.

15 When a portable object A or B is present on any one of the antennae, the information is sent back to the management unit via an antenna discrimination device D which receives all the response signals from the said antennae by means of the input points D1 to DN.

20 The role of this device D is to collect this set of information issuing from the antennae and to transmit a resulting signal S to the management unit, whilst enabling it to know the origin thereof.

25 In the example illustrated in this Figure 3, the antenna A2 has detected a portable object B which has been selected by the anti-collision algorithm AL.

30 In a practical manner, the antenna discrimination device D has hard-wired logic comprising for example a set of RS flip-flops and an adding device AD. One RS flip-flop is allocated to each antenna in the network.

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If, in response to the simultaneous transmission of signals to the network of antenna, several antennae see a return portable object detection signal, the RS flip-flops allocated to these antennae are set to 1, which makes it possible to identify the origin of the return signal, that is to say the antenna which transmitted this signal.

The discriminator D consequently makes it possible to give the identification number of the antenna to the management unit, which will enter into communication with the portable object detected by the said antenna.

The management unit will enter into communication with a selected portable object and reset to zero the state of the RS flip-flop corresponding to the antenna which detected this portable object.

This embodiment is particularly adapted to applications such as access control in a building having entry doors to control and manage and the management of the rights allocated to the different individuals entering this building. This embodiment makes it possible in fact to manage priorities according to the entry doors and the rights allocated to the people entering.

A description will now be given of the second embodiment illustrated by the diagram in Figure 4.

In this embodiment the connection between the management unit and the network of antennae is for example effected by an I2C bus. The transmission/reception equipment ER1 is of the open

collector type in order to superimpose all the response signals S1-SN arriving at the input point I of the management system TG.

5 The management unit OG is also provided with an anti-collision algorithm AL and intelligence for processing and analysing the information received from the portable objects.

10 As in the previous case, the management unit makes it possible to simultaneously interrogate all the antennae in the network from its output point O, in order to detect the presence of a portable object.

This embodiment also makes it possible to identify the antennae in the network.

15 Another difference compared with the embodiment which has just been described with regard to Figure 3 is that the identification of the antenna is effected by a logic L, conventional per se, placed in each antenna.

20 In the case of this second embodiment, the anti-collision algorithm is used by the management unit as soon as a return signal received by the transmission/reception system ER1 is received at its input port.

25 The equipment ER1 in this case makes it possible to supply the resulting signal S to the management unit.

This is because, according to the technology of the equipment, it is possible to have a single input port I at the management unit connected by a connection

of the serial transmission type to all the antennae in the network.

5 This connection will for example be effected by an I2C bus. The technology of the equipment is an open collector technology, which allows the addition of all the response signals transmitted.

Thus, when a portable object is detected on any one of the antennae, the information is sent back directly to the management unit.

10 The management unit can know the origin of the information since each antenna and more particularly the logic L which each antenna has makes it possible to concatenate the identification information of the said antennae with the messages sent in response to the signals transmitted by the management unit.

15 By way of example, illustrated by Figure 4, the antenna AN has detected a portable object A selected by the anti-collision algorithm AL in order to enter into communication with this portable object.

20 This second embodiment covers the same applications as the embodiment depicted by Figure 3.

A third embodiment is illustrated by the diagram in Figure 5.

25 In this embodiment there is the same type of connection between the management unit and the antenna network, that is to say a connection of the parallel transmission type with for example an I2C bus. The transmission/reception equipment ER1 of the management unit has a technology of the open collector type
30 allowing the addition of response signals received at

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the input I so as to supply a resulting signal S to the management unit itself.

5 The management unit contains the anti-collision algorithm and the intelligence for processing and analysing the information received from the portable objects.

10 In the same way as in the embodiments described above, this unit simultaneously interrogates all the antennae in the network in order to detect the presence of a portable object.

This embodiment is particularly adapted to the case where it is not necessary to know the origin of the information of the received signals.

15 It applies particularly in the fields of application such as motorway tolls, anti-theft gates, time stamping (time clock), parking and the counting of objects, etc.

20 In the example illustrated in this Figure 5, it can be seen that a portable object B has been selected by one of the antennae in the network by the anti-collision algorithm AL.

As has just been seen, the management proposed by the invention does not have recourse to scrutiny and has the following advantages:

25 - the response time of the system to the presentation of an object is independent of the number of antennae,

- the complexity of the management unit is independent of the number of antennae,

- any type of anti-collision algorithm can be used for implementing this method,

- the management unit does not need to know the number of antennae installed in the network,

5 - the intelligence of the antennae can be eliminated completely.

10 The invention applies to any type of contactless portable object of the ISO 14443-A and ISO 14443-B type, tags (electronic label), operating at frequencies of 13.56 MHz or 125 kHz.

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CLAIMS

1. A method of detecting portable objects using a network of N antennae, controlled by a centralised management unit, principally characterised in that it includes the following steps:

- the transmission by the management unit of signals simultaneously to all the antennae,
- the reception by the said unit of a resulting signal comprising response signals from the antennae which have detected a portable object,
- the successive selection of each object detected from this resultant signal, according to a pre-established sequence.

2. A detection method according to Claim 1, characterised in that the successive selection of each object is effected by the use of an anti-collision algorithm.

3. A detection method according to Claim 1, characterised in that the reception of the resulting signal by the management unit is obtained by the reception of the response signals from the antennae respectively at the input point of the unit reserved for each antenna and adding the said signals.

4. A detection method according to Claim 1, characterised in that the reception of a resulting signal by the management unit is obtained by reception of the said resulting signal at an input point of the unit reserved for all the antennae in the system.

5. A detection method according to any one of the preceding claims, characterised in that the reception of the resulting signal includes a step of identifying the origin of the response signals forming the said resulting signal.

6. A detection method according to Claims 3 and 5, characterised in that the identification of a response signal includes a step of storing the identification of the corresponding antenna known by the input point at which the response signal is received.

7. A detection method according to Claim 6, characterised in that the storage consists of positioning a flip-flop in a logic state and deactivating it when the unit has entered into communication with the portable object detected by the corresponding antenna.

8. A detection method according to Claims 4 and 5, characterised in that the identification of a response signal includes a step of concatenating the identification of the antenna in the response signal sent by the antenna.

9. A system of detecting portable objects including a network of N antennae associated with transmission/reception means and a centralised management unit, characterised in that:

- the management unit (OG) includes:
- transmission/reception means (ER1) connected to the transmission/reception means of the antennae,

- the transmission means of the management unit being able to send signals simultaneously to all the antenna,

5 - and the reception means of the said unit being able to receive the response signals from the antennae which have detected a portable object, in the form of distinct signals for each antenna or a resulting signal, according to the type of connection established between the transmission/reception means of
10 the management unit and the antennae, and

- means (AL) for successively selecting each portable object detected according to a pre-established sequence.

10. A detection system according to Claim 9,
15 characterised in that the means for successively selecting each portable object detected in a pre-established sequence includes an anti-collision algorithm.

20 11. A detection system according to Claim 9 or 10, characterised in that the transmission/reception means of the management unit and the transmission/reception means of the antenna are connected in point to point mode (I1-IN) by connections of the serial transmission type.

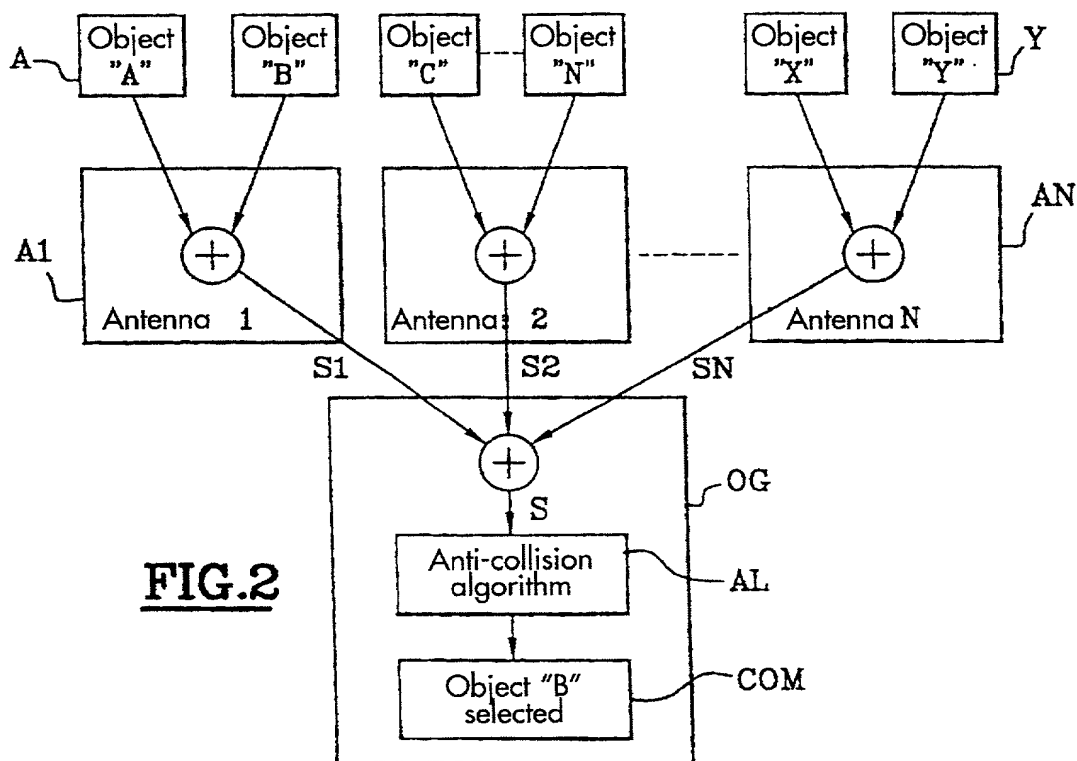
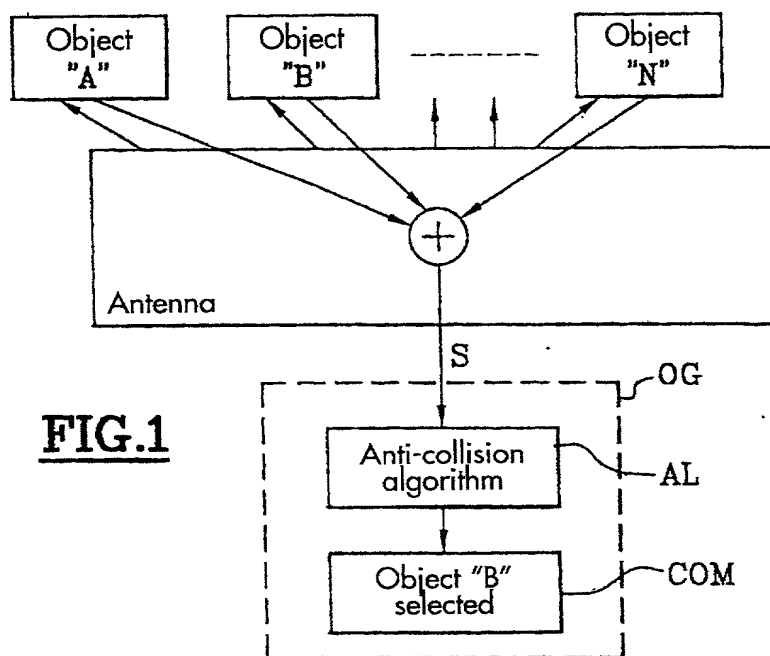
25 12. A detection system according to Claim 9 or 10, characterised in that the transmission/reception means of the management unit include an input point (I) connected to all the antennae by a connection of the serial transmission type.

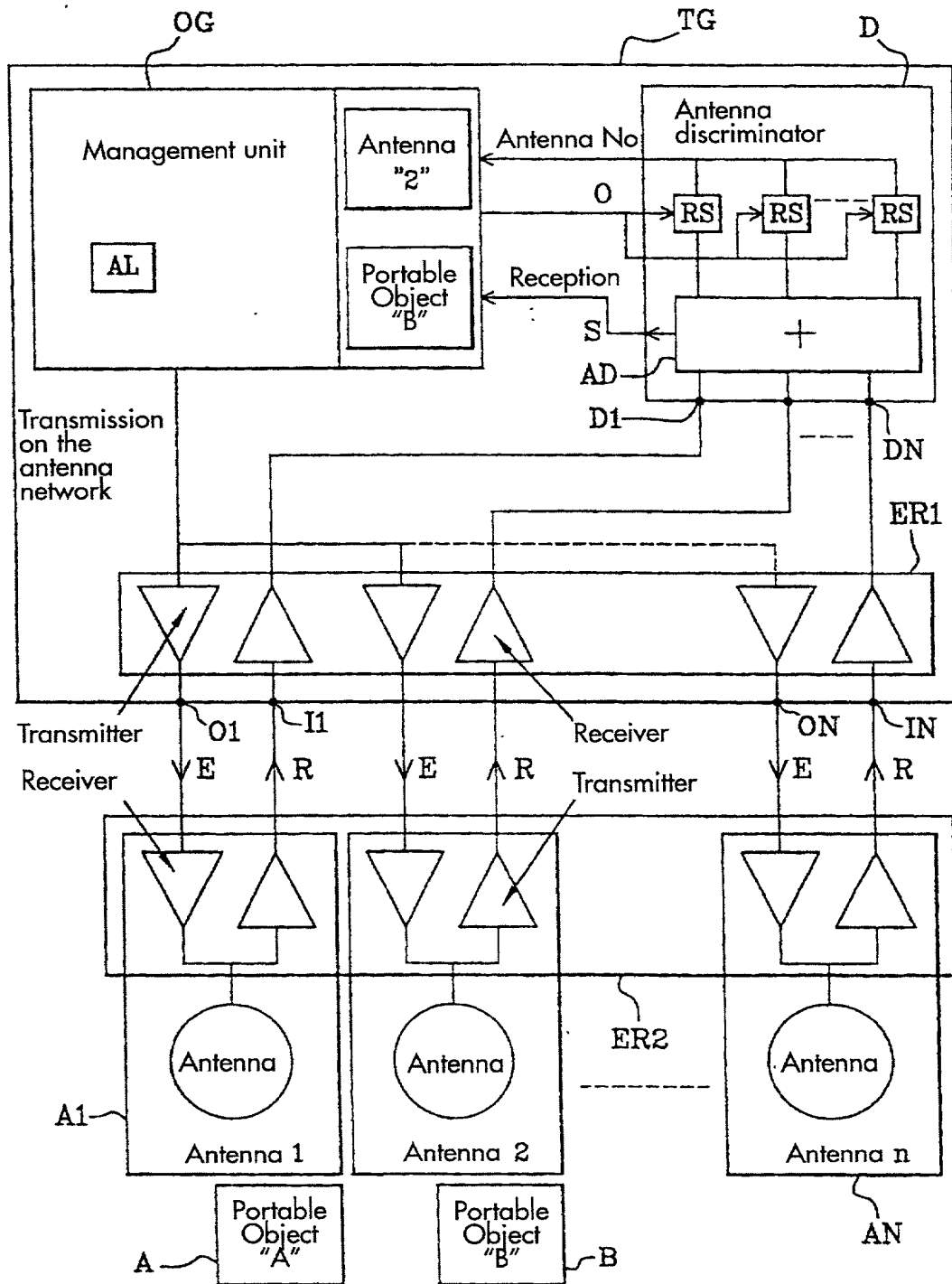
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13. A detection system according to Claim 11, characterised in that the management unit includes an antenna discriminator (D).

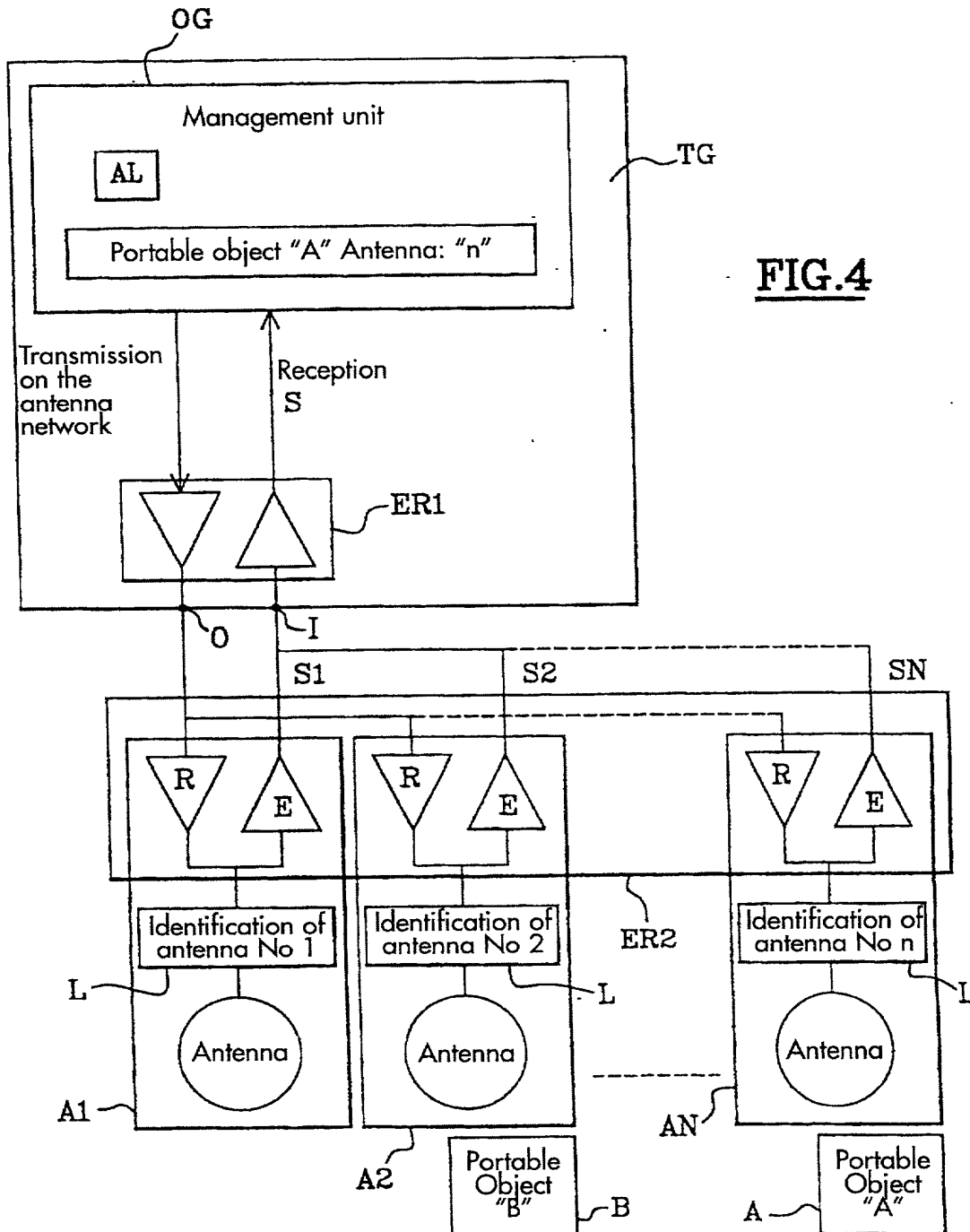
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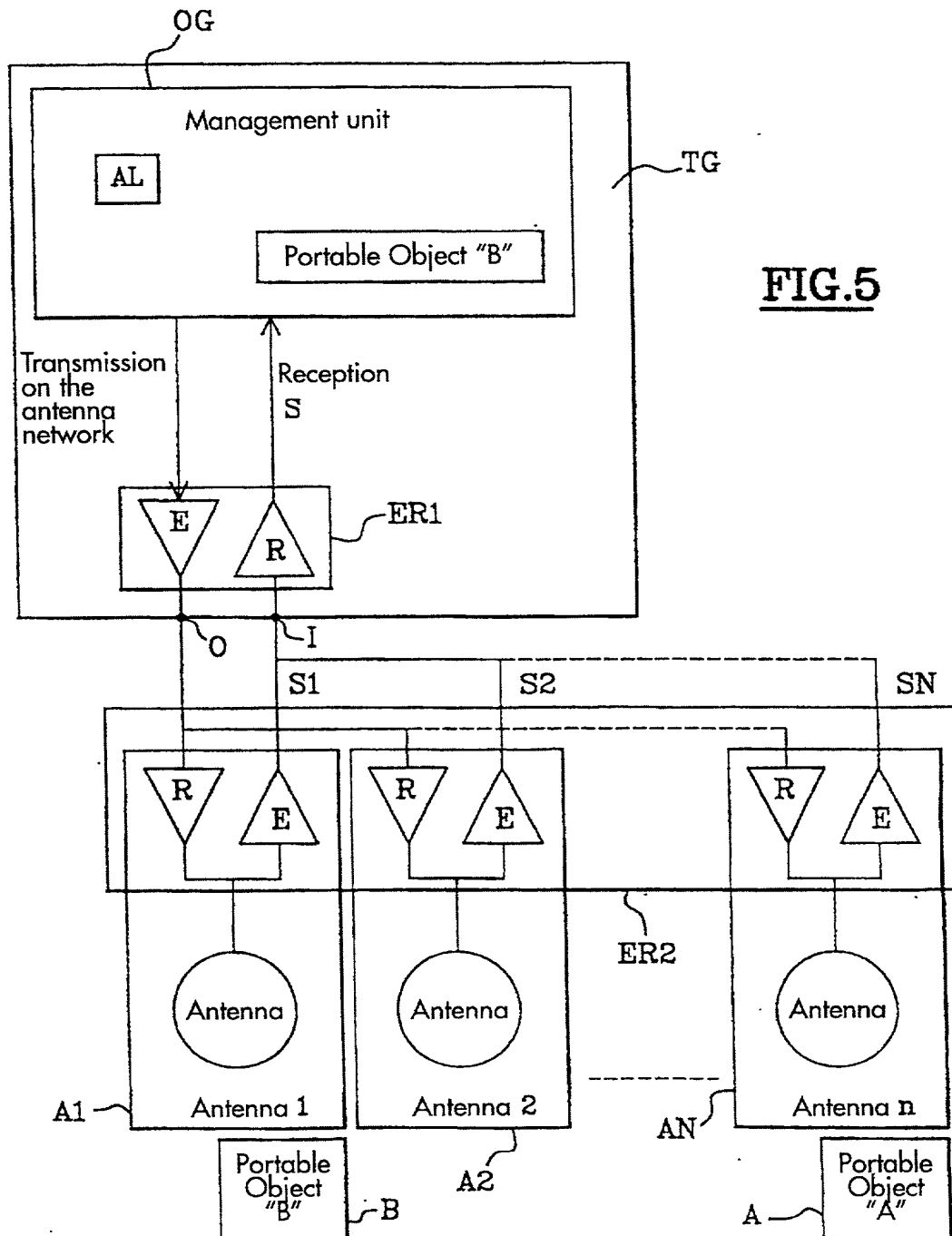


**FIG.3**

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**FIG.5**

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(Includes Reference to Provisional and International (PCT) Applications)

Attorney's Docket No.
GEM691

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I BELIEVE I AM THE ORIGINAL, FIRST AND SOLE INVENTOR (IF ONLY ONE NAME IS LISTED BELOW) OR AN ORIGINAL, FIRST AND JOINT INVENTOR (IF PLURAL NAMES ARE LISTED BELOW) OF THE SUBJECT MATTER WHICH IS CLAIMED AND FOR WHICH A PATENT IS SOUGHT ON THE INVENTION ENTITLED:

Method for detecting portable objects and system for carrying out said method

The specification of which (check only one item below):

- ☐ is attached hereto,
☐ was filed as United States Patent Application Number _____
on _____
and was amended on _____ (if applicable).
- ☒ was filed as International (PCT) Application Number PCT/FR00/00230
on January 31st 2000
and was amended on _____ (if applicable).

I HAVE REVIEWED AND UNDERSTAND THE CONTENTS OF THE ABOVE-IDENTIFIED SPECIFICATION, INCLUDING THE CLAIMS, AS AMENDED BY ANY AMENDMENT REFERRED TO ABOVE.

I ACKNOWLEDGE THE DUTY TO DISCLOSE TO THE U.S. PATENT AND TRADEMARK OFFICE ALL INFORMATION KNOWN TO ME TO BE MATERIAL TO PATENTABILITY AS DEFINED IN TITLE 37, CODE OF FEDERAL REGULATIONS, Sec. 1.56 (as amended effective March 16, 1992);

I do not know and do not believe the said invention was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to said application; that said invention was not in public use or on sale in the United States of America more than one year prior to said application; that said invention has not been patented or made the subject of an inventor's certificate issued before the date of said application in any country foreign to the United States of America on any application filed by me or my legal representatives or assigns more than six months prior to said application;

I hereby claim foreign priority benefits under Title 35, United States Code, §§ 119 (a)-(e) of any foreign application(s) for patent or inventor's certificate or of any International (PCT) Application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT International (PCT) Application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. §119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. §119
FRANCE	FR99/01521	09/02/1999	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PCT	FR00/00230	31/01/2000	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

(APPLICATION NUMBER)

(FILING DATE)

(APPLICATION NUMBER)

(FILING DATE)

708080-75606860

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONT'D)
(Includes Reference to Provisional and International (PCT) Applications)

Attorney's Docket
No. GEM691

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or International (PCT) Application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to the patentability as defined in Title 37, Code of Federal Regulations § 1.56, which became available between the filing date of the prior application(s) and the national or international filing date of this application:

PRIOR U.S. APPLICATIONS OR INTERNATIONAL (PCT) APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. § 120:

U.S. APPLICATIONS		STATUS (check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. APPLICATION NUMBERS ASSIGNED (if any)		

I hereby appoint the following attorneys and agent(s) to prosecute said application and to transact all business in the U.S. Patent and Trademark Office connected therewith and to file, prosecute and to transact all business in connection with international applications directed to said invention:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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